

## Solid Tantalum Chip Capacitors TANTAMOUNT<sup>®</sup>, Hi-Rel COTS, Ultra-Low ESR, Conformal Coated Case


**FEATURES**

- High reliability; Weibull failure rate grading available
- Surge current testing per MIL-PRF-55365 options available
- Ultra-low ESR
- Tin/lead (SnPb) termination available
- Compliant to RoHS directive 2002/95/EC


**RoHS\***  
COMPLIANT

**PERFORMANCE CHARACTERISTICS**

**Operating Temperature:** - 55 °C to + 85 °C  
(To + 125 °C with voltage derating)  
**Capacitance Range:** 10 µF to 1500 µF

**Capacitance Tolerance:** ± 10 %, ± 20 % standard  
**Voltage Rating:** 4 WV<sub>DC</sub> to 75 WV<sub>DC</sub>

<b>ORDERING INFORMATION</b>							
T97 TYPE	R CASE CODE	227 CAPACITANCE	K CAPACITANCE TOLERANCE	020 DC VOLTAGE RATING AT + 85 °C	E TERMINATION/ PACKAGING <small>(Available options are series dependent)</small>	S RELIABILITY LEVEL	A SURGE CURRENT
See Ratings and Case Code table.	This is expressed in pF. The first two digits are the significant figures. The third is the number of zeros to follow.	K = ± 10 % M = ± 20 %	This is expressed in volts. To complete the three-digit block, zeros precede the voltage rating. A decimal point is indicated by an "R" (6R3 = 6.3 V).	E = Sn/Pb solder/7" (178 mm) reel L = Sn/Pb solder/7" (178 mm), 1/2 reel C = 100 % tin/7" (178 mm), reel H = 100 % tin/7" (178 mm), 1/2 reel	A = 1.0 % Weibull B = 0.1 % Weibull <sup>(1)</sup> S = 40 h burn-in Z = Non- established reliability	A = 10 cycles at + 25 °C B = 10 cycles at - 55 °C/ + 85 °C S = 3 cycles at 25 °C	

**Note**

(1) Available on select ratings. See ratings table on page 2.

<b>DIMENSIONS</b> in inches [millimeters]							
CASE CODE	L (MAX.)	W	H	A	B	D (REF.)	J (MAX.)
E	0.299 [7.6]	0.173 ± 0.016 [4.4 ± 0.4]	0.157 ± 0.016 [4.0 ± 0.4]	0.051 ± 0.012 [1.3 ± 0.3]	0.180 ± 0.025 [4.6 ± 0.6]	0.253 [6.4]	0.004 [0.1]
F	0.299 [7.6]	0.238 ± 0.016 [6.0 ± 0.4]	0.187 ± 0.016 [4.7 ± 0.4]	0.051 ± 0.012 [1.3 ± 0.3]	0.180 ± 0.025 [4.6 ± 0.6]	0.243 [6.2]	0.004 [0.1]
R	0.299 [7.6]	0.238 + 0.016/- 0.024 [6.0 + 0.4/- 0.6]	0.142 ± 0.016 [3.6 ± 0.4]	0.051 ± 0.012 [1.3 ± 0.3]	0.180 ± 0.025 [4.6 ± 0.6]	0.243 [6.2]	0.004 [0.1]
V	0.299 [7.6]	0.173 ± 0.016 [4.4 ± 0.4]	0.079 [2.0] Max.	0.051 ± 0.012 [1.3 ± 0.3]	0.180 ± 0.025 [4.6 ± 0.6]	0.253 [6.4]	0.004 [0.1]
Z	0.299 [7.6]	0.238 ± 0.016 [6.0 ± 0.4]	0.238 ± 0.016 [6.0 ± 0.4]	0.051 ± 0.012 [1.3 ± 0.3]	0.180 ± 0.025 [4.6 ± 0.6]	0.243 [6.2]	0.004 [0.1]
D	0.299 [7.6]	0.173 ± 0.016 [4.4 ± 0.4]	0.137 [3.5] Max.	0.051 ± 0.012 [1.3 ± 0.3]	0.180 ± 0.025 [4.6 ± 0.6]	0.253 [6.4]	0.004 [0.1]
M	0.315 [8.0]	0.259 + 0.016/-0.024 [6.6 + 0.4/-0.6]	0.141 ± 0.016 [3.6 ± 0.4]	0.051 ± 0.012 [1.3 ± 0.3]	0.196 ± 0.025 [5.0 ± 0.6]	0.259 [6.6]	0.004 [0.1]
H	0.315 [8.0]	0.259 + 0.016/-0.024 [6.6 + 0.4/-0.6]	0.204 ± 0.016 [5.2 ± 0.4]	0.051 ± 0.012 [1.3 ± 0.3]	0.196 ± 0.025 [5.0 ± 0.6]	0.259 [6.6]	0.004 [0.1]
N	0.315 [8.0]	0.259 + 0.016/-0.024 [6.6 + 0.4/-0.6]	0.252 ± 0.016 [6.4 ± 0.4]	0.051 ± 0.012 [1.3 ± 0.3]	0.196 ± 0.025 [5.0 ± 0.6]	0.259 [6.6]	0.004 [0.1]

**Note**

- The anode termination (D less B) will be a minimum of 0.012" [0.3 mm]

\* Pb containing terminations are not RoHS compliant, exemptions may apply



RATINGS AND CASE CODE										
F	4 V	6.3 V	10 V	16 V	20 V	25 V	35 V	50 V	63 V	75 V
10									D	R
15								E/R	R	
22								R	F	
33								F		
47							R	Z/N		
68						R				
100										
150						F				
220				E	R	M				
330		V	E		H/F					
470	V	E	E	H						
680	E	E	R							
1000	E/R	R	F							
1500	R									
2200										

STANDARD RATINGS						
CAPACITANCE ( $\mu$ F)	CASE CODE	PART NUMBER	MAX. DCL AT + 25 °C ( $\mu$ A)	MAX. DF AT + 25 °C 120 Hz (%)	MAX. ESR AT + 25 °C 100 kHz (m $\Omega$ )	MAX. RIPPLE 100 kHz I <sub>RMS</sub> (A)
<b>4 WV<sub>DC</sub> at + 85 °C, 2.7 WV<sub>DC</sub> at + 125 °C</b>						
470	V	T97V477(1)004(2)(6)(5)	19	8	30	2.2
680	E	T97E687(1)004(2)(6)(5)	27	6	25	2.9
1000	E	T97E108(1)004(2)(4)(5)	40	8	20	3.3
1000	R	T97R108(1)004(2)(4)(5)	40	8	18	3.7
1500	R	T97R158(1)004(2)(6)(5)	60	8	15	4.1
<b>6.3 WV<sub>DC</sub> at + 85 °C, 4 WV<sub>DC</sub> at + 125 °C</b>						
330	V	T97V337(1)6R3(2)(6)(5)	21	8	38	2.0
470	E	T97E477(1)6R3(2)(6)(5)	30	6	30	2.7
680	E	T97E687(1)6R3(2)(6)(5)	43	6	25	2.9
1000	R	T97R108(1)6R3(2)(4)(5)	63	8	20	3.5
<b>10 WV<sub>DC</sub> at + 85 °C, 7 WV<sub>DC</sub> at + 125 °C</b>						
330	E	T97E337(1)010(2)(4)(5)	33	6	35	2.5
470	E	T97E477(1)010(2)(6)(5)	47	6	28	2.8
680	R	T97R687(1)010(2)(6)(5)	68	6	28	3.0
1000	F	T97F108(1)010(2)(6)(5)	100	20	120	1.4
<b>16 WV<sub>DC</sub> at + 85 °C, 10 WV<sub>DC</sub> at + 125 °C</b>						
220	E	T97E227(1)016(2)(4)(5)	35	8	60	2.3
470	H	T97H477(1)016(2)(4)(5)	75	14	100	1.4
<b>20 WV<sub>DC</sub> at + 85 °C, 13 WV<sub>DC</sub> at + 125 °C</b>						
220	R	T97R227(1)020(2)(6)(5)	44	8	80	1.8
330	F	T97F337(1)020(2)(6)(5)	66	10	100	1.6
330	H	T97H337(1)020(2)(4)(5)	66	10	100	1.6

**Notes**

- (1) Capacitance tolerance: K, M
- (2) Termination and packaging: C, E, H, L
- (3) Reliability level: A, S, Z
- (4) Reliability level: A, B, S, Z
- (5) Surge current: A, B, S
- (6) Reliability level: S, Z

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Vishay Sprague

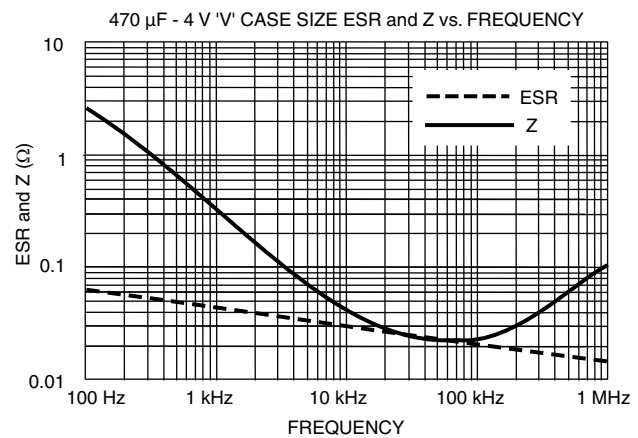
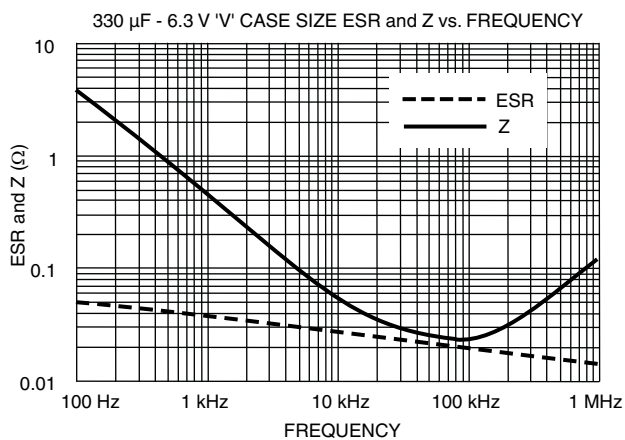
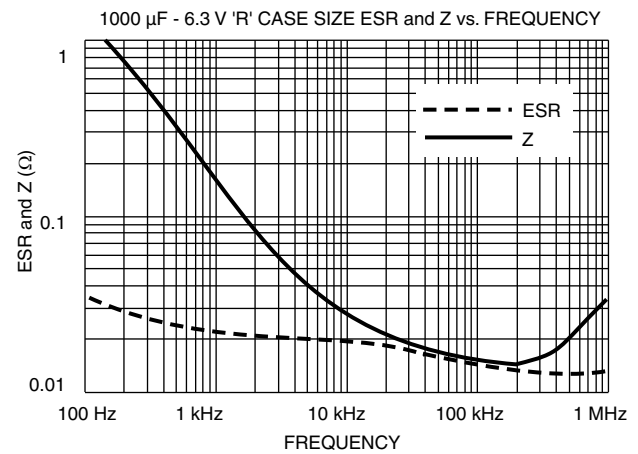
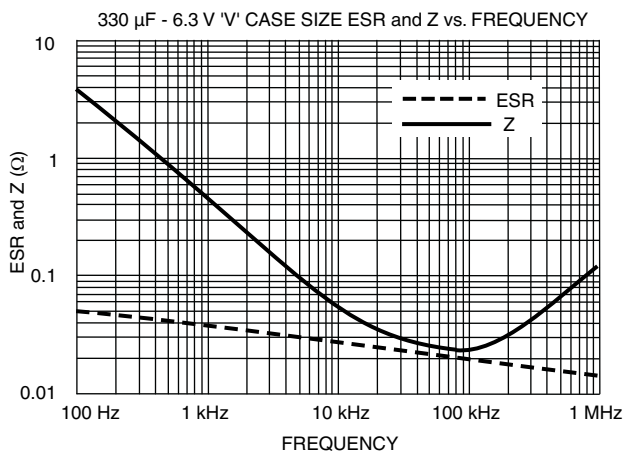
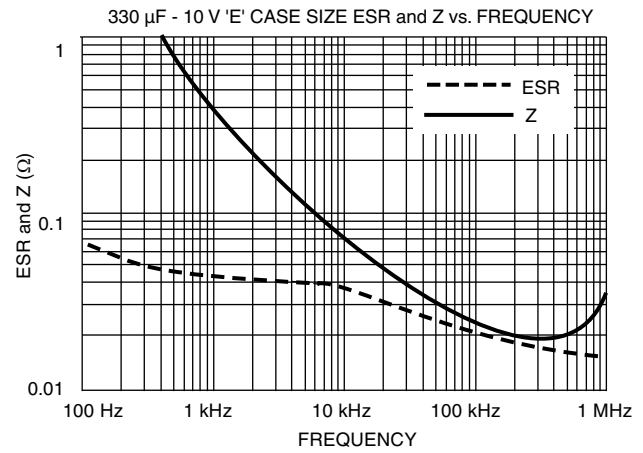
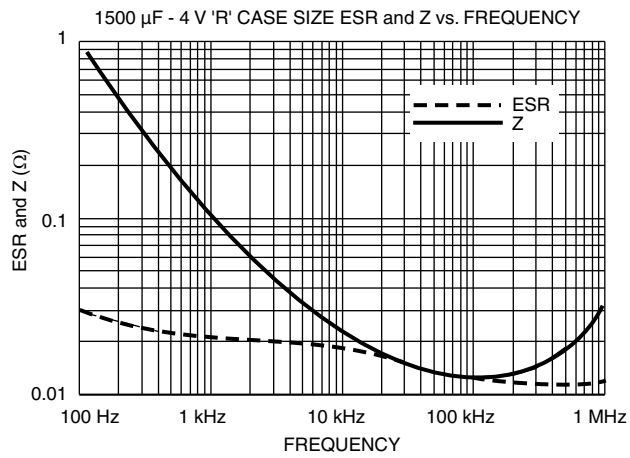
<b>STANDARD RATINGS</b>						
<b>CAPACITANCE (<math>\mu</math>F)</b>	<b>CASE CODE</b>	<b>PART NUMBER</b>	<b>MAX. DCL AT + 25 °C (<math>\mu</math>A)</b>	<b>MAX. DF AT + 25 °C 120 Hz (%)</b>	<b>MAX. ESR AT + 25 °C 100 kHz (m<math>\Omega</math>)</b>	<b>MAX. RIPPLE 100 kHz I<sub>RMS</sub> (A)</b>
<b>25 WV<sub>DC</sub> at + 85 °C, 17 WV<sub>DC</sub> at + 125 °C</b>						
68	R	T97R686(1)025(2)(4)(5)	17	6	100	1.6
150	F	T97F157(1)025(2)(4)(5)	38	8	80	1.8
220	M	T97M227M025(2)(3)(5)	55	8	100	1.6
<b>35 WV<sub>DC</sub> at + 85 °C, 23 WV<sub>DC</sub> at + 125 °C</b>						
47	R	T97R476(1)035(2)(4)(5)	17	6	80	1.8
<b>50 WV<sub>DC</sub> at + 85 °C, 33 WV<sub>DC</sub> at + 125 °C</b>						
15	E	T97E156(1)050(2)(4)(5)	8	6	300	0.9
15	R	T97R156(1)050(2)(4)(5)	8	6	250	1.0
22	R	T97R226(1)050(2)(4)(5)	11	6	220	1.2
33	F	T97F336(1)050(2)(3)(5)	17	6	150	1.3
47	Z	T97Z476(1)050(2)(6)(5)	24	6	240	1.4
47	N	T97N476(1)050(2)(4)(5)	24	6	150	1.4
<b>63 WV<sub>DC</sub> at + 85 °C, 42 WV<sub>DC</sub> at + 125 °C</b>						
10	D	T97D106(1)063(2)(3)(5)	10	6	400	0.6
15	R	T97R156(1)063(2)(6)(5)	10	6	400	0.8
22	F	T97F226(1)063(2)(3)(5)	14	6	250	1.1
<b>75 WV<sub>DC</sub> at + 85 °C, 50 WV<sub>DC</sub> at + 125 °C</b>						
10	R	T97R106(1)075(2)(6)(5)	8	6	500	0.7

**Notes**

- (1) Capacitance tolerance: K, M
- (2) Termination and packaging: C, E, H, L
- (3) Reliability level: A, S, Z
- (4) Reliability level: A, B, S, Z
- (5) Surge current: A, B, S
- (6) Reliability level: S, Z



**TYPICAL CURVES**





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